Zhu, X.-S., and H. Yu, 2019: Environmental influences on the intensity and configuration of tropical cyclone concentric eyewalls in the western North Pacific. *J. Meteor. Soc. Japan,* **97**, 153-173. https://doi.org/10.2151/jmsj.2019-008

Plain Language Summary: The observed intensity changes of tropical cyclones (TCs) with concentric eyewalls (CEs) often varied case from case. This study establishes a relationship between intensity changes and CE patterns, and also shows the environmental influences on the configuration of different CE patterns. The results may be beneficial for forecasting intensity fluctuations of a TC with CE from the current environmental configurations.

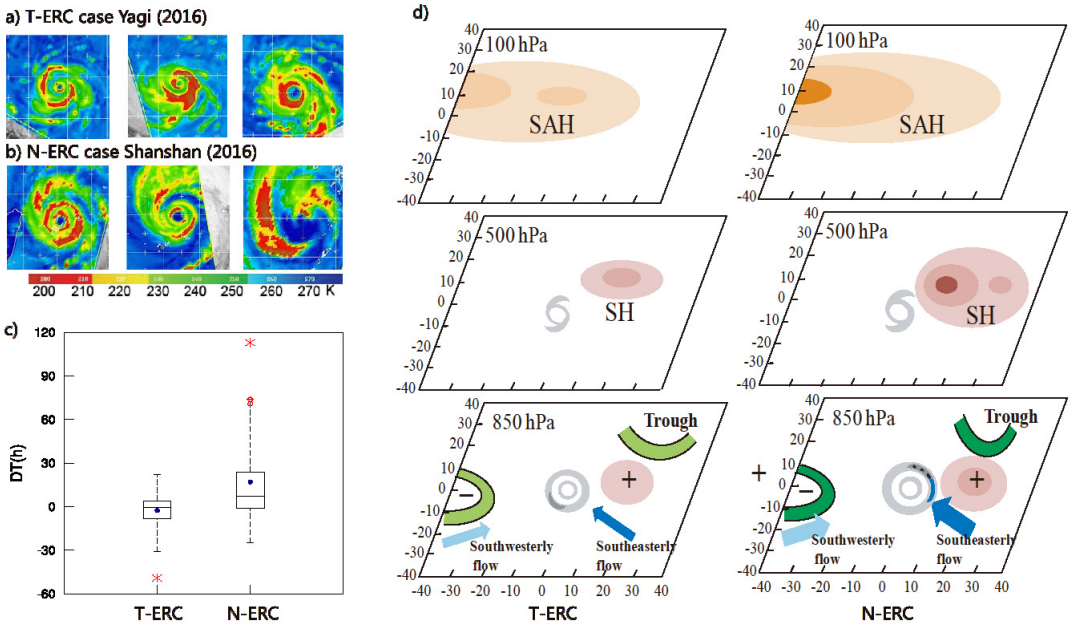

Figure 1. Different characteristics between two main CE patterns, including a CE with typical eyewall replacement cycle (T-ERC) and a CE without the replacement cycle (N-ERC). The CE cases are shown in (a) and (b), respectively. (c) The time differences (DT) between CE formation and peak intensity, and (d) the environmental configurations for T-ERC and N-ERC patterns. The SAH and SH in (d) are South Asia high and subtropical high.

- Definitions for CE patterns are summarized based on the CE structural evolution in microwave satellite observations from 1997 to 2011 in the western North Pacific.
- Statistical results showed that a TC will reach peak intensity around CE formation for one particular CE pattern, while it may intensify to the peak before CE formation for another CE pattern.
- The environmental configurations for the two CE patterns above are significantly different in the moisture inflows, the activities of low-level trough, the subtropical high, and the South Asia high, which are summarized in the three-dimensional conceptual models.